

1 Team

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2 Objectives

The overall objectives of the knowledge visit were to:

- a. Understand in depth the architecture of eLMIS software in Rwanda from the subnational to National level
- b. Understand how the eLMIS functionality (user requirements and detailed specifications) were developed
- c. Explore if eLMIS software is compatible or can be customized for Zimbabwean systems
- d. Explore the capabilities and limitations of the current software
- e. Look and learn practical experience from the sites implementing eLMIS
- f. To understand other critical success factors for the successful deployment of such a software

3 Background

The Ministry has been using manual systems at sub national level for logistics management. Paper based reports are sent to national level where they are captured into software at central level on regular basis but this has led to the following challenges;

- Data quality has not been good
- Data visibility has not been real time
- Reporting rates have been not been optimal
- Decisions on redistributions have not been data driven

In order to strengthen health systems and ensure data visibility, the Ministry of Health and Child Care has decided to embrace information communication technology (ICT) through the use of electronic Logistics Management Information Systems (eLMIS) at national and sub national level. Over the years

computerized warehouse inventory management system was only adapted at central warehouse level (NatPharm) while all other health facilities continue to use paper based LMIS. In 2013 the Ministry through the Directorate of Pharmacy Services designed, developed and piloted a computerized pharmacy inventory management and dispensing software at three selected sites (central, provincial and district hospital) mainly to manage antiretrovirals (ARVs). The piloted software is not currently linked with the warehouse inventory management system at NatPharm (Microsoft Dynamics) making it difficult to assess national stock situation at any given time. Other systems also exist such as the ePMS for ARVs and standalone systems at a few central hospitals.

The software that should be used in Zimbabwe for LMIS should have the following characteristics:

- a. Ordering
- b. Visibility of stock information at higher levels
- c. Dispensing
- d. Stock management
- e. Reporting on essential data elements; stock on hand, consumption and losses/adjustments
- f. Interoperability with other software for porting data into databases such as DHIS 2 or Navision
- g. Mobile client component for sharing logistics data especially from lower levels such as clinics to districts
- h. Scalability- ability to handle and progressively increase the number of products managed under the system
- i. Ability to manage other commodities such as laboratory reagents and equipment and other health commodities
- j. Cost – should be deployed at minimal costs and sustainable with local resources

The Country has visited Zambia where an eLMIS is in place and produced a report. The Rwanda visit was planned to be the final visit outside the country for the team to witness another system in operation. The next activity on the plan was to similarly assess the local systems and recommend a system to stakeholder.

4 eLMIS landscape in Rwanda

Ministry of Health, Rwanda operates a three tier logistic system using the eLMIS system. These are the Central Level (Medical Procurement and Production Department, MPPD); District Pharmacies (DPs) and District Level (District Hospitals and Health facilities). In addition, there is also the Bureau des Formations Médicales Agréées du Rwanda (BUFMAR) which is a non-profit mission sector foundation that supplies the private sector and some public sectors facilities. BUFMAR is currently not using eLMIS. The district pharmacy level's role is to receive orders, process and supply products and when product are not available, order from the central level. In addition, they also have a supervisory and training role to the districts on supply chain management.

The eLMIS system started in 2014 in one district which had one district Pharmacy, 17 health facilities and 68 online users. It has scaled up to all the 30 district pharmacies, 48 hospitals and a phased roll out to more than 600 health facilities covered to date. The benefits they have realized to date include, improved order fill rate; near real time logistics data; data visibility and improved wastage and expiry management. It performs the following business functions; Procurement, Inventory

Management and transport management. It is a proprietary system and is hosted in the cloud in South Africa. A copy of the information is also shared with the country.

The system is integrated to the warehouse information system (SAGE 500) at MPPD. Orders are sent to SAGE through eLMIS and processed at the warehouse. The picklist is then released into eLMIS where District facilities are able to view before delivery of orders. Health facilities use the smallest units and orders are collated at District pharmacies using units of issue at MPPD.

5 Current capabilities of the system

5.1 Inventory management

| Function | Expectations | Rwanda System Capability |
|--|--|---|
| Stock on hand | To view stock on hand at facility, district and national level | Capable, at both levels , MPPD and Ministry level |
| Transactions view | To view current and historical inventory transactions | Capable |
| Creation of multiple stock locations at facility level | Capable of creation of different stores and locations (bins) allowing for partitioning of stock between different locations. | Capable. Stores then issues products to the locations. |
| Reorder levels | Allows the setting up of reorder levels for individual medicines | Capable |
| Range of products managed | Manages all product categories, medical surgical and laboratory | Capable |
| Electronic signature | Able to view electronic signature of user | The roles in the system and log in details can trace the user |
| Stock adjustments | Ability to create different adjustments and record information on these | Capable |
| Batch tracking | Ability to track item by batch throughout supply chain | Capable at MPPD and facility |

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|-----------------------------|---|---|
| Tracking expiry dates, FEFO | Ability to dispense or issue on first expiry first out basis and notify on impending expiry | Capable at Central level and facility level |
| Proof of delivery | Ability to automatically populate quantities issued from central warehouse and PODs | Capable |

5.2 Dispensing

| Function | Expectations | Rwanda System Capability |
|-----------------------|--|---|
| Real time dispensing | Electronic prescription delivery to pharmacy | Not capable. Dispensing is done using paper registers that are product based and aggregated onto monthly summary register. Consumption is then updated into system from each location |
| Batch dispensing | Dispense by batch to patient | Not capable |
| Labels | Generate and customize medicines labels | Not capable |
| Electronic stock card | Automatic update of electronic stock card Recording of batch number, expiry dates and batch specific transactions Automatic calculation of AMC and relate to Min and Max | Use inventory reports Capable through inventory reports Capable, though consumption is updated manually in the system from the service delivery points |

5.3 Reporting

| Function | Expectations | Rwanda System Capability |
|---|---|--|
| Stock Status Report at facility and central level | To generate and view stock status report at Facility and any higher level Dashboards | Capable, dashboards not very informative. Health facility can generate custom reports |
| Stock Status Report at National Level | Ability to combine facility and medical stores stock status | Capable |
| Generation of reports | Ability to generate customized reports such as, stock status, timeliness, quantities dispensed, adjustments, Short dated stock according to set parameters, regimen breakdown, Workload Statistics- number of prescriptions dispensed over a period, Suggested order items and quantities | Capable |
| Licence fees | Affordable annual license fees | To get figures from Ministry |
| Setup costs | Affordable set up costs | To get figures from Ministry |

6 Field Visits

6.1 Medical Procurement and Production Department (MPPD)

The unit is responsible for procurement and manufacturing of a range of products. They are using the eLMIS for orders, transport management and shipping products. The eLMIS is linked to the warehouse system, SAGE 500. The Sage 500 being used for order processing, scheduling and financials.

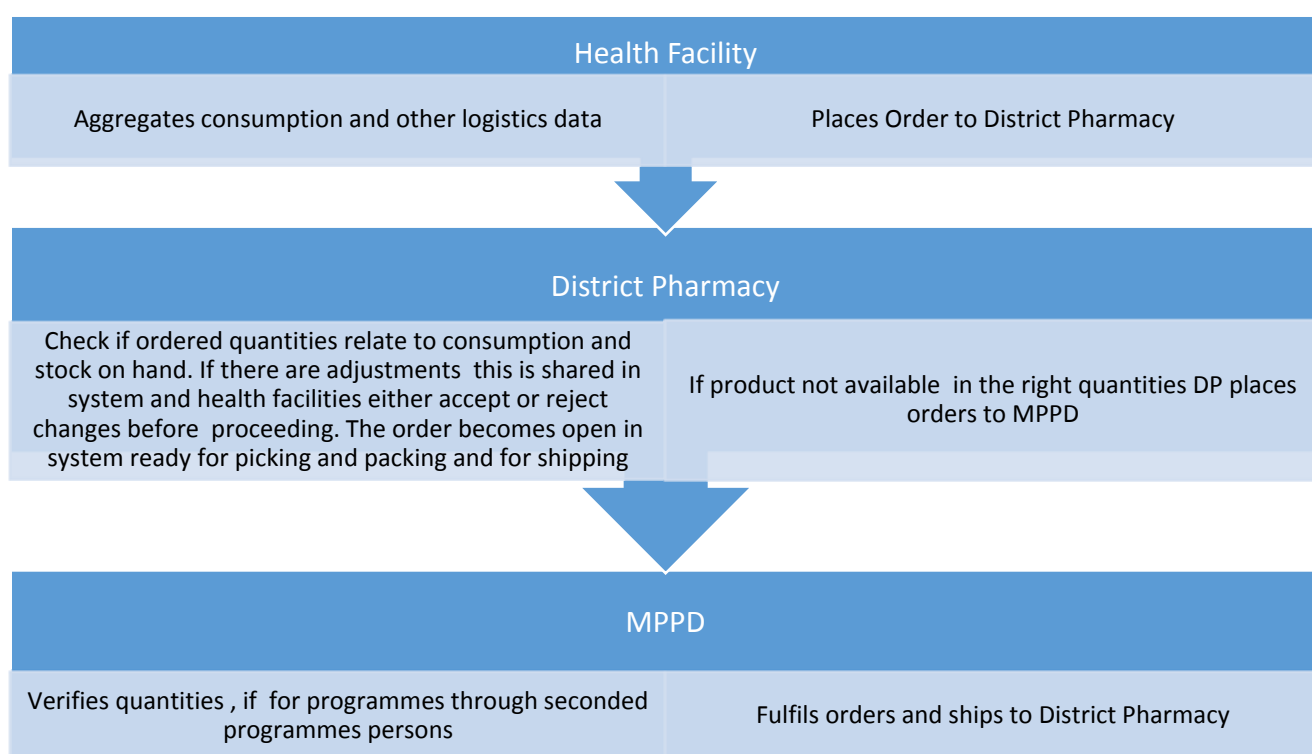
The ordering is based on a set schedule. District Pharmacies order from MPPD and referral hospitals, health centres do not order directly from MPPD. There are ten members of the order processing

team and they include programme officers who validate orders for their programmes. When processing an order, availability is confirmed outside eLMIS from a SAGE 500 exported master files in excel. Order continues where the item(s) are reserved for the facility once completed as “promise” pending buyer/vendor confirmation after which it becomes “open “for processing by SAGE 500. Completed orders are pushed back into eLMIS for transportation and shipping.

The team finally toured the MPPD warehouse and the workstations which use an open office approach where almost all the team is housed in one big office with workstations.

6.2 Nyarugenge District Pharmacy

Led by the Pharmacist in Charge of LMS in the Ministry the team visited the district pharmacy which is led by a Director. Other staff members include one data manager, two stores managers, one accountant, one assistant accountant and two store hands. It serves one hospital, ten health centres and ten private clinics who are not in the eLMIS system. Summary of the flow of information



Each of the workers has defined roles in the system and in some cases multiple roles. Intelligence is built in the system witnessed at the DP such as not allowing to make an order using a past date. It was highlighted that orders can be made outside the system using specially formatted excel sheets which are then uploaded into system when creating orders. Other additional features were cloning of orders for predictable monthly orders, making adjustments and customized dashboard. Benefits reported by the staff include quicker order processing and reduced workload attributed to paperwork.

6.3 Rugarama RHC

Led by the Director of the District Pharmacy the team moved to Rugarara RHC. The eLMIS system at the facility is managed by a stores manager who is a nurse specifically assigned to the pharmacy. The storeroom used both manual stock cards and eLMIS. The stores manager issues stock to service delivery points created in the system using the eLMIS and updates the stock cards when transferring

the stock physically. Stocks issued on a first expiry first out (FEFO) basis and batches are tracked at that point.

At the service delivery points such as pharmacy dispensary, wards and laboratory, staff use paper registers for dispensed to user data. Batches are not tracked on dispensing and the smallest unit is used. At the dispensary the team observed that they use a product based register to track consumption and summarizes on another register the quantity consumed per day. The weekly consumption is then reported to the stores manager for updating consumption in the system and stock reconciliations. After updating consumption, the manager can view stocks available in each of the service delivery points.

In the event of termination of work for the stores manager, appointments are made by the clinic director who informs the DPs. They train the individual on the job for a day and open their accounts and assigned roles.

Benefits as reported by the stores manager of the system were; better management of expiries and wastages, easier management of stocks. She however was not happy with the current scenario of using both paper and eLMIS as it increased workload. The Ministry was working on giving out a policy position on the use of the dual system, JSI which was supporting the paper system had stopped supporting that system opting for the eLMIS.

6.4 Teaching Hospital

The referral hospital is manned by pharmacists and stores managers. The facility was only using eLMIS for managing medicines for programmes such as TB, malaria and HIV/AIDs. For other essential medicines they were using OpenClinic and SAGE 100. Currently working on synchronization of the systems. They order products for programmes using eLMIS to MPPD and some through the District pharmacy.

6.5 GHSC-PSM Project: Chemonics

The project took over from JSI, the official Rwanda Government PSM partner which was supporting the system since inception. Initially they supported paper based system before roll out of the eLMIS which is now at 98% utilization in the country. The challenge noted was the continued use of paper registers which were viewed by staff members as double work. On their part they stopped supporting the paper system since September 2015.

The project supported the training of staff on eLMIS and project management. The District Pharmacists were part of the system design at the onset and the user acceptance testing. Trainer of Trainers (TOT) course was also offered to the 20 district pharmacists and 5 at central level at the implementation stage as super users in the system. System champions in the form of head of institution and the officer in charge of stores for each facility were trained to oversee and implement system. In their setting ordering for laboratory is done through the pharmacy and laboratory used their own system. The training was two and half weeks as it involved staff bringing in registers and pre filled templates for inputting into the system during the duration of training and use of that data. The overall training costs were USD 2 million to date.

The annual licence for the system is USD 250,000 and the Ministry is paying for this. The project currently working on data cleaning before further business intelligence is incorporated in the system. The following has been supported by JSI and later GHSC-PSM; initial assessment, post implementation evaluations and cost benefit analysis.

Finally, the project advised the team of areas they need to emphasize and critical success factors should they want to implement a similar system;

- Develop standardized nomenclature and coding of medicines
- Knowledge transfer should be done by any implementing partner at the very start for sustainability
- Measures to ensure complete utilization of system should be drafted and implemented
- Data quality plan with data quality indicators should be considered at inception.
- Basic computer literacy of participants.
- Good internet connection for the web based system

7 Discussions and recommendations

| Area | Lesson Learnt | Recommendations for Zimbabwe | Timeline | Responsible |
|-------------------|---|--|-------------------|-------------------------------------|
| Project Inception | Human Resources to be critically analyzed. | Propose cadres who are critical to the success of the system. | 15 September 2016 | DPS |
| | | Develop roles for other staff in eLMIS | 15 September 2016 | DPS |
| | | Develop the Scope of Work of a full time project coordinator | 31 September 2016 | MOHCC/Partner |
| | The dispensing and logistics can operate as two separate system considerations with their own merits and demerits | Develop TORs for dispensing module | 2 September 2016 | DPS |
| | | Develop TORs for LMS Module | 2 September 2016 | DPS |
| Project Inception | Technical working group and project management critical to the success | Include Deputy Director IT and other related officers in the TWG | Immediate | DPS |
| | | Include eLMIS agenda in the National ICT TWG and eHealth Policy | Immediate | Director Finance and Administration |
| | | Include other partners in TWG | Immediate | DPS |
| | Streamline resources to avoid duplication of effort and waste | Map available resources from all partners and mobilize to cover any gaps | 15 September 2016 | DPS |

Rwanda Electronic Management Information System Learning Visit 22-24 August 2016

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| | Buy in of stakeholders crucial | Consult programmes, departments and PMDs, DMOs on the project for their buy in. Make a presentation to Top Management Team Make a presentation to PS/PMD Meetings | Immediate and on going Next PS Meeting Next PMD/PS Meeting | DPS DPS DPS |
| System and support | A closed system can also be considered as opposed to open system. Open systems may need continuous updates and may have other salient costs | Based on the country requirements, need to expand the pool of systems to consider proprietary systems. | On going | DPS |
| | | Develop concept note of pros and cons of open and closed systems | 15 September 2016 | MOHCC/RTI |
| | | Integrate available systems | On going | MOHCC |
| | For a web system constant internet availability is required | Assess whether the existing bandwidth can accommodate additional systems | 15 September 2016 | MOHCC |
| | | Assess the availability of network points at the facilities (work areas where the system is to be used) | 15 September 2016 | MOHCC |
| | | Consider system with offline capabilities | On going | MOHCC/UNDP |
| | | Power back up | On going | MOHCC/UNDP |
| | System security should be defined clearly for accountability | Enforce system security when implementing | On going | MOHCC/UNDP |
| | Local support is needed for system | Empower Provincial IT officers and Health Information Officers as system support | On going | MOHCC |

Rwanda Electronic Management Information System Learning Visit 22-24 August 2016

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| | Hardware | Quantify the number of required label printers | 15 September 2016 | MOHCC |
| | | Assess the additional computers required (after considering available investments) | 15 September 2016 | MOHCC |
| | | Assess how the eLMIS will be included in the existing servers in the data centre | 15 September 2016 | MOHCC IT |
| Training and data use | Training and data quality and utilization strategy needed | Develop training budget and plan | 30 September 2016 | MOHCC DPS |
| | | Train local staff as superusers | On going | MOHCC DPS |
| | | Train heads of facilities and their technical staff as systems champions at local level | On going | MOHCC DPS |
| | | Review data utilization and track data quality indicators | Immediate and ongoing | MOHCC/UNDP |
| | | Develop a strong post implementation support plan | 31 September 2016 | MOHCC/UNDP |
| Operations | Operation plan needed | Meeting of TWG to agree on TOR | 15 September 2016 | DPS |
| | | Develop Scope of Work for the project | 20 September 2016 | MOHCC/UNDP |
| | | Review Scope of Work of project coordinator | 15 September 2016 | DPS |

8 Conclusion

The Rwanda system met most of the requirement of Zimbabwe ideal system except one major area of dispensing where the team felt that this has been the most problematic area of the accountability in the supply chain of medicines and was not in that system.

The eLMIS system reviewed worked well in their settings with a few areas of improvement noted. It has also been stable in the two and half years it had been in operation. The government and their partners working together to ensure success of the system. The staff at the facilities clear appreciated the benefits of the system except the continued use of the manual system. It was also noted that the data generated from eLMIS has not been used for quantification as analysis of data coming out from eLMIS and paper based system has not been systematically analyzed.